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5 February 1991

AGREEMENT

CONCERNING THE ADOPTION OF UNIFORM CONDITIONS OF APPROVAL AND RECIPROCAL RECOGNITION OF APPROVAL FOR MOTOR VEHICLE EQUIPMENT AND PARTS

done at Geneva on 20 March 1958

Addendum 78: Regulation No. 79

Date of entry into force as an annex to the Agreement:
1 December 1988

Revision 1

Incorporating Supplement 1* to this Regulation in its original form (not requiring changes in the approval number)
Date of entry into force: 11 February 1990

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO STEERING EQUIPMENT

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* In this text the modifications which are subject to the Depositary Notification C.N.224-1990.TREATIES-34 dated 9 November 1990 also appear.

UNITED NATIONS

Regulation No. 79

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO STEERING EQUIPMENT

CONTENTS

REGULATION		Page
1.	Scope	1
2.	Definitions	1
3.	Application for approval	4
4.	Approval	5
5.	Construction provisions	6
6.	Test provisions	8
7.	Conformity of production	11
8.	Penalties for non-conformity of production	11
9.	Modification and extension of approval of the vehicle type	12
10.	Production definitely discontinued	12
11.	Names and addresses of technical services responsible for conducting approval tests and of administrative departments	12

ANNEXES

Annex 1 - Communication concerning the approval or refusal or extension or withdrawal of approval or production definitely discontinued of a vehicle type with regard to steering equipment pursuant to Regulation No. 79

Annex 2 - Arrangements of approval marks

Annex 3 - Braking performance for vehicles using the same energy source to supply steering equipment and braking device

Annex 4 - Additional provisions for vehicles equipped with ASE

Regulation No. 79

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO STEERING EQUIPMENT

1. SCOPE

This Regulation applies to the steering equipment of vehicles of categories M, N and O. It does not cover steering transmissions which at any point are purely hydraulic or electric, except on auxiliary steering equipment (ASE) fitted to vehicles of categories M_1 and N_1. Purely pneumatic transmissions are not permitted.

2. DEFINITIONS

For the purposes of this Regulation:

2.1. "Approval of a vehicle" means the approval of a vehicle type with regard to its steering equipment;

2.2. "Vehicle type" means a category of vehicle which does not differ with respect to the manufacturer's designation of the vehicle type and/or variations which can affect its steering;

2.3. "Steering equipment" means all the equipment the purpose of which is to determine the direction of movement of the vehicle.

The steering equipment consists of:

The steering control,

The steering transmission,

The steered wheels,

The energy supply, if any.

2.3.1. "Steering control" means the part of the steering equipment which controls its operation, it may be operated with or without direct intervention of the driver. For steering equipment in which the steering forces are provided solely or partly by the muscular effort of the driver the steering control includes all parts up to the point where the steering effort is transformed by mechanical, hydraulic or electrical means;

2.3.2. "Steering transmission" includes all parts of the steering equipment which are the means of transmitting the steering forces between the steering control and the steered wheels; it includes all parts down from the point where the steering control effort is transformed by mechanical, hydraulic or electrical means;

2.3.3. "Steered wheels" means the wheels the alignment of which may be altered directly or indirectly in relation to the longitudinal axis of the vehicle in order to determine the direction of movement of the vehicle. (The steered wheels include the axis around which they are rotated in order to determine the direction of movement of the vehicle);

2.3.4. "Energy supply" includes those parts of the steering equipment which provide it with energy, control the energy and where appropriate, process and store it. It also includes any storage reservoirs for the operating medium and the return lines, but not the vehicle's engine (except for the purposes of paragraph 5.1.3.) or its drive to the energy source;

2.3.4.1. "Energy source" means that part of the energy supply which provides the energy in the required form, e.g. hydraulic pump, air compressor;

2.3.4.2. "Energy reservoir" means that part of the energy supply in which the energy provided by the energy source is stored;

2.3.4.3. "Storage reservoir" means that part of the energy supply in which the operating medium is stored at or near to the atmospheric pressure.

2.4. Steering parameters

2.4.1. "Steering control effort" means the force applied to the steering control in order to steer the vehicle;

2.4.2. "Steering time" means the period of time from the beginning of the movement of the steering control to the moment at which the steered wheels have reached a specific steering angle;

2.4.3. "Steering angle" means the angle between the projection of a longitudinal axis of the vehicle and the line of intersection of the wheelplane (being the central plane of the tyre, normal to the spin axis of the wheel) and the road surface;

2.4.4. "Steering forces" mean all the forces operating in the steering transmission;

2.4.5. "Mean steering ratio" means the ratio of the angular displacement of the steering control to the mean of the swept steering angle of the steered wheels for a full lock-to-lock turn;

2.4.6. "Turning circle" means the circle within which are located the projections onto the ground plane of all the points of the vehicle, excluding the external mirrors and the front direction indicators, when the vehicle is driven in a circle;

2.4.7. "Nominal radius of steering control" means in the case of a steering wheel the shortest dimension from its centre of rotation to the outer edge of the rim. In the case of any other form of control it means the distance between its centre of rotation and the point at which the steering effort is applied. If more than one such point is provided, the one requiring the greatest effort shall be used.

2.5. Types of steering equipment

Depending on the way the steering forces are produced, the following types of steering equipment are distinguished:

2.5.1. For motor vehicles:

2.5.1.1. Manual steering equipment in which the steering forces result solely from the muscular effort of the driver;

2.5.1.2. Power assisted steering equipment in which the steering forces result from both the muscular effort of the driver and the energy supply (supplies);

2.5.1.2.1. Steering equipment in which the steering forces result solely from one or more energy supplies when the equipment is intact, but in which the steering forces can be provided by the muscular effort of the driver alone if there is a fault in the steering (integrated power systems), is also considered to be power assisted steering equipment;

2.5.1.3. Full-power steering equipment in which the steering forces are provided solely by one or more energy supplies;

2.5.1.4 Self-tracking equipment is a system designed to create a change of steering angle on one or more wheels only when acted upon by forces and/or moments applied to the tyre to road contact.

2.5.2. For trailers:

2.5.2.1. Self-tracking equipment

See paragraph 2.5.1.4 above.

2.5.2.2. Articulated steering equipment in which the steering forces are produced by a change in direction of the towing vehicle and in which the movement of the steered trailer wheels is firmly linked to the relative angle between the longitudinal axis of the towing vehicle and that of the trailer;

2.5.2.3. Self-steering equipment in which the steering forces are produced by a change in direction of the towing vehicle and in which the movement of the steered trailer wheels is firmly linked to the relative angle between the longitudinal axis of the trailer frame or a load replacing it and the longitudinal axis of the sub-frame to which the axle(s) is (are) attached;

2.5.3. Depending on the arrangement of the steered wheels, the following types of steering equipment are distinguished:

2.5.3.1. Front-wheel steering equipment in which only the wheels of the front axle(s) are steered. This includes all wheels which are steered in the same direction;

2.5.3.2. Rear-wheel steering equipment in which only the wheels of the rear axle(s) are steered. This includes all wheels which are steered in the same direction;

2.5.3.3. Multi-wheel steering equipment in which the wheels of one or more of each of the front and the rear axle(s) are steered;

2.5.3.3.1. All-wheel steering equipment in which all the wheels are steered.

2.5.3.3.2. Buckle steering equipment in which the movement of chassis parts relative to each other is directly produced by the steering forces.

2.5.3.4. Auxiliary steering equipment (ASE) in which the rear wheels of vehicles of categories M_1 and N_1 are steered in addition to the front wheels in the same direction or in the opposite direction to the front wheels, and/or the steering angle of the front wheels and/or the rear wheels may be adjusted relative to vehicle behaviour.

3. APPLICATION FOR APPROVAL

3.1. The application for approval of a vehicle type with regard to the steering equipment shall be submitted by the vehicle manufacturer or by his duly accredited representative.

3.2. It shall be accompanied by the undermentioned documents in triplicate, and by the following particulars:

3.2.1. a description of the vehicle type with regard to the items mentioned in paragraph 2.2 above; the vehicle type shall be specified;

3.2.2. a diagram of the steering equipment as a whole, showing the position on the vehicle of the various devices influencing the steering.

3.3. A vehicle representative of the vehicle type to be approved shall be submitted to the technical service responsible for conducting approval tests.

3.4. The competent authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.

4. APPROVAL

4.1. If the vehicle submitted for approval pursuant to this Regulation meets the requirements of paragraphs 5 and 6 below, approval of that vehicle type with regard to the steering equipment shall be granted.

4.1.1. The competent authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.

4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00 for the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party may not assign this number to another vehicle type or to the same vehicle type submitted with different steering equipment from that described in the documents required by paragraph 3.2. above, subject to the provisions of paragraph 6 below of this Regulation.

4.3 Notice of approval or of extension or refusal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement which apply this Regulation, by means of a form conforming to the model in annex 1 to this Regulation.

4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type approved under this Regulation, an international approval mark consisting of:

4.4.1. a circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval; 1/

4.4.2. the number of this Regulation, followed by the letter R, a dash and the approval number to the right of the circle prescribed in paragraph 4.4.1.

4.5. If the vehicle conforms to a vehicle type approved, under one or more other Regulations annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1. need not be repeated; in such a case the regulation and approval numbers and the additional symbols of all the Regulations under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1.

4.6. The approval mark shall be clearly legible and shall be indelible.

4.7. The approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.

4.8. Annex 2 to this Regulation gives examples of arrangements of approval marks.

5. CONSTRUCTION PROVISIONS

5.1. General provisions

5.1.1. The steering equipment shall ensure easy and safe handling of the vehicle up to its maximum design speed or, in the case of a trailer up to its technically permitted maximum speed. There must be a tendency to self-centre when tested in accordance with paragraph 6. The vehicle shall meet the requirements of paragraph 6.2. in the case of motor vehicles and of paragraph 6.3. in the case of trailers. If a vehicle is fitted with ASE it shall also meet the requirements of annex 4 to this Regulation

5.1.1.1. It must be possible to travel along a straight section of road without unusual steering correction by the driver and without unusual vibration in the steering system at maximum design speed of the vehicle.

5.1.1.2. There must be travel synchronization between the steering control and the steered wheels except for the wheels steered by ASE.

5.1.1.3. There must be time synchronization between the steering control and the steered wheels except for the wheels steered by ASE.

5.1.2. The steering equipment shall be designed, constructed and fitted in such a way that it is capable of withstanding the stresses arising during normal operation of the vehicle, or combination of vehicles. The maximum steering angle shall not be limited by any part of the steering transmission unless specifically designed for this purpose.

5.1.2.1. Unless otherwise specified, it will be assumed that for the purposes of this Regulation, not more than one failure can occur in the steering equipment at any one time and two axles on one bogie shall be considered as one axle.

5.1.3. Should the engine stop or a part of the steering equipment fail, with the exception of those parts listed in paragraph 5.1.4., the steering equipment shall always meet the requirements of paragraph 6.2.6. in the case of motor vehicles and of paragraph 6.3. in the case of trailers.

5.1.4. For the purposes of this Regulation parts which are not considered to be susceptible to failure include the steered wheels and the mechanical parts of the steering transmission and the steering control.

5.1.5. Any failure in a transmission other than purely mechanical must clearly be brought to the attention of the vehicle driver; in the case of a motor vehicle, an increase in steering effort is considered to be a warning signal; in the case of a trailer, a mechanical indicator is permitted. When a failure occurs, a change in the average steering ratio is permissible if the steering effort given in paragraph 6.2.6. below is not exceeded.

5.2. Special provisions

5.2.1. Steering control

5.2.1.1. If the steering control is directly handled by the driver:

5.2.1.1.1. it must be manageable;

5.2.1.1.2. the direction of operation of the steering control must correspond to the intended change in direction of the vehicle;

5.2.1.1.3. except for ASE, there must be a continuous and monotonic relation between the steering control angle and the steering angle.

5.2.2. Steering transmission

5.2.2.1. Adjustment devices for steering geometry must be such that after adjustment a positive connection can be established between the adjustable components by appropriate locking devices.

5.2.2.2. Steering transmission which can be disconnected to cover different configurations of a vehicle (e.g. on extendible semi-trailers), must have locking devices which ensure positive relocation of components; where locking is automatic, there must be an additional safety lock which is operated manually.

5.2.3. Steered wheels

5.2.3.1. The steered wheels shall not be solely the rear wheels. This requirement does not apply to semi-trailers.

5.2.3.2. Trailers (with the exception of semi-trailers) which have more than one axle with steered wheels and semi-trailers which have at least one axle with steered wheels must fulfil the conditions given in paragraph 6.3. below. However, for trailers with self-tracking equipment a test under paragraph 6.3. is not necessary if the axle load ratio between the unsteered and the self-tracking axles equals or exceeds 1.6 under all loading conditions.

5.2.4. Energy supply

5.2.4.1. The same energy source may be used to supply the steering equipment and the braking device. However, in the case of a failure of either the energy supply or a failure in one of the two systems the following conditions must be fulfilled.

5.2.4.1.1. The steering equipment shall meet the requirements of paragraph 6.2.6.

5.2.4.1.2. If an energy source failure occurs, the braking performance shall not drop below the prescribed service brake performance, as given in annex 3, on the first brake application.

5.2.4.1.3. If an energy supply failure occurs, the braking performance must comply with the prescriptions of annex 3.

5.2.4.1.4. If the fluid in the storage reservoir drops to a level liable to cause an increase in steering or braking effort an acoustic or optical warning must be given to the driver. This warning may be combined with a device provided to warn of brake failure; the satisfactory condition of the lamp must be easily verifiable by the driver.

5.2.4.2. The same energy source may be used to supply the steering equipment and systems other than the braking device if, when the fluid level in the storage reservoir drops to a level liable to cause an increase in steering effort, an acoustic or optical warning is given to the driver; the satisfactory condition of the lamp must be easily verifiable by the driver.

5.2.4.3. The warning devices must be directly and permanently connected to the circuit. When the engine is running under normal operating conditions and there are no faults in the steering equipment, the alarm device must give no signal except during the time required for charging the energy reservoir(s) after start-up of the engine.

6. TEST PROVISIONS

6.1. General provisions

6.1.1. The test shall be conducted on a level surface affording good adhesion.

6.1.2. During the test(s) the vehicle shall be loaded to its technically permissible load on the steered axle(s). In the case of axles fitted with ASE this test shall be repeated with the vehicle loaded to its technically permissible maximum mass and the axle equipped with ASE loaded to its maximum permissible load.

6.1.3. Before the test begins, the tyre pressures shall be as prescribed by the manufacturer for the load specified in paragraph 6.1.2 when the vehicle is stationary.

6.2. Provisions for motor vehicles

6.2.1. It must be possible to leave a curve with a radius of 50 m at a tangent without unusual vibration in the steering equipment at the following speed:

Category M_1 vehicles: 50 km/h

Category M_2, M_3, N_1, N_2 and N_3 vehicles: 40 km/h

or the maximum design speed if this is below the speeds given above.

6.2.2. The requirements of paragraphs 5.1.1.1., 5.1.1.2. and 6.2.1. shall also be satisfied with a failure in the steering equipment.

6.2.3. When the vehicle is driven in a circle with its steered wheels at approximately half lock and at a constant speed of at least 10 km/h, the turning circle must remain the same or become larger if the steering control is released.

6.2.4. During the measurement of the control effort, forces with a duration of less than 0.2 seconds shall not be taken into account.

6.2.5. The measurement of steering efforts on motor vehicles with intact steering equipment

6.2.5.1. The vehicle shall be driven from straight ahead into a spiral at a speed of 10 km/h. The steering effort shall be measured at the nominal radius of the steering control until the position of the steering control corresponds to turning radius given in the table below for the particular category of vehicle with intact steering. One steering movement shall be made to the right and one to the left.

6.2.5.2. The maximum permitted steering time and the maximum permitted steering control effort with intact steering equipment are given in the table below for each category of vehicle.

6.2.6. The measurement of steering efforts on motor vehicles with a failure in the steering equipment

6.2.6.1. The test described in paragraph 6.2.5. shall be repeated with a failure in the steering equipment. The steering effort shall be measured until the position of the steering control corresponds to the turning radius given in the table below for the particular category of vehicle with a failure in the steering equipment.

6.2.6.2. The maximum permitted steering time and the maximum permitted steering control effort with a failure in the steering equipment are given in the table below for each category of vehicle.

Table

STEERING CONTROL EFFORT REQUIREMENTS

Vehicle Category	INTACT			WITH A FAILURE		
	Maximum effort (daN)	Time (s)	Turning radius (m)	Maximum effort (daN)	Time (s)	Turning Radius (m)
M_1	15	4	12	30	4	20
M_2	15	4	12	30	4	20
M_3	20	4	12	45	6	20
N_1	20	4	12	30	4	20
N_2	25	4	12	40	4	20
N_3	20	4	12 (or full lock if 12 is not attainable)	45 */	6	20

*/ 50 for rigid vehicles with 2 or more steered axles excluding self-tracking equipment.

6.3. Provisions for trailers

6.3.1. The trailer must travel without excessive deviation or unusual vibration in its steering equipment when the towing vehicle is travelling in a straight line on a flat and horizontal road at a speed of 80 km/h or the technically permissible maximum speed indicated by the trailer manufacturer if this is less than 80 km/h.

6.3.2. With the towing vehicle and trailer having adopted a steady state turn so that the front outside edge of the towing vehicle is turning alongside a circle of radius 25 m in accordance with paragraph 2.4.6., at a constant speed of 5 km/h, the circle described by the rearmost outer edge of the trailer shall be measured. This manoeuvre shall be repeated under the same conditions but at a speed of 25 km/h ± 1 km/h. During these manoeuvres, the rearmost outer edge of the trailer travelling at a speed of 25 km/h ± 1 km/h shall not move outside the circle described at a constant speed of 5 km/h by more than 0.7 m.

6.3.3. No part of the trailer must move more than 0.5 m beyond the tangent to a circle with a radius of 25 m when towed by a vehicle leaving the circular path described in paragraph 6.3.2. along the tangent and travelling at a speed of 25 km/h. This requirement must be met from the point the tangent meets the circle to a point 40 m along the tangent. After that point the trailer must fulfil the condition specified in paragraph 6.3.1.

6.3.4. The tests described in paragraphs 6.3.2. and 6.3.3. shall be conducted with one steering movement to the left and one to the right.

7. CONFORMITY OF PRODUCTION

7.1. A vehicle approved to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set forth in paragraphs 5 and 6 above.

7.2. In order to verify that the requirements of paragraph 7.1. are met, suitable controls of the production shall be carried out.

7.3. The holder of the approval shall in particular:

7.3.1. ensure existence of procedures for the effective control of the quality of products,

7.3.2. have access to the control equipment necessary for checking the conformity to each approved type,

7.3.3. ensure that data of test results are recorded and that annexed documents shall remain available for a period to be determined in accordance with the administrative service,

7.3.4. analyse the results of each type of test, in order to verify and ensure the stability of the product characteristics making allowance for variation of an industrial production.

7.4. The competent authority which has granted type-approval may at any time verify the conformity control methods applicable to each production unit.

7.4.1. In every inspection, the test books and production survey records shall be presented to the visiting inspector.

7.4.2. The competent authority may carry out any test prescribed in this Regulation.

7.4.3. The normal frequency of inspections authorized by the competent authority shall be one every two years. If unsatisfactory results are recorded during one of these visits, the competent authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.

8. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

8.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 7.1. is not complied with or if the vehicle or vehicles taken fail to pass the tests prescribed in paragraph 7 above.

8.2. If a contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a communication form conforming to the model in annex 1 to this Regulation.

9. MODIFICATION AND EXTENSION OF APPROVAL OF THE VEHICLE TYPE

9.1. Every modification of the vehicle type shall be notified to the administrative department which approved the vehicle type. The department may then either:

9.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the vehicle still complies with the requirements; or

9.1.2. Require a further test report from the technical service responsible for conducting the tests.

9.2. Confirmation or extension or refusal of approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 4.3. above to the Parties to the Agreement applying this Regulation.

9.3. The competent authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

10. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of vehicle approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

11. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF ADMINISTRATIVE DEPARTMENTS

The Parties to the 1958 Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the technical services responsible for conducting approval tests and of the administrative departments which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries, are to be sent.

Notes

1/ 1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for Czechoslovakia, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15-16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal and 22 for the Union of Soviet Socialist Republics. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicles Equipment and Parts and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

Annex 1

(Maximum format: A 4 (210 x 297 mm))

issued by: Name of administration

.....

.....

.....

concerning: 2/ APPROVAL GRANTED
APPROVAL EXTENDED
APPROVAL REFUSED
APPROVAL WITHDRAWN
PRODUCTION DEFINITELY DISCONTINUED

of a vehicle type with regard to steering equipment pursuant to Regulation No. 79

Approval No. ..... Extension No. .....

1. Trade name or mark of vehicle .....

2. Vehicle type .....

3. Manufacturer's name and address .....

4. If applicable, name and address of manufacturer's representative .....

.....

5. Brief description of the steering equipment:

5.1 Type of steering equipment .....

5.2 Steering control .....

5.3 Steering transmission .....

5.4 Steered wheels .....

5.5 Energy source .....

.....

6. Results of tests. Steering effort required to achieve a turning circle of 12 metres radius or 20 metres with a fault:

6.1 Under normal conditions .....

6.2 After failure of special equipment .....

7. Vehicle submitted for approval on .....

8. Technical service responsible for conducting approval tests .....

.....

9. Date of report issued by that service .....

10. Number of report issued by that service .....

11. Approval granted/extended/refused/withdrawn 2/

12. Position of approval mark on vehicle .....

.....

13. Place .....

14. Date .....

15. Signature .....

16. Annexed to this communication is a list of documents in the approval file deposited at the administration services having delivered the approval and which can be obtained upon request.

Notes

1/ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

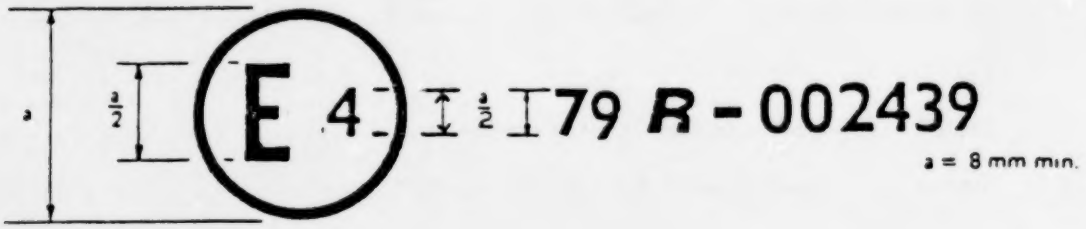
2/ Strike out what does not apply.

Annex 2

ARRANGEMENTS OF APPROVAL MARKS

Model A

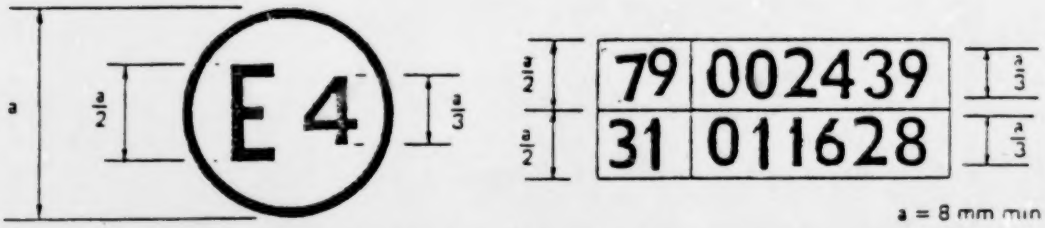
(See paragraph 4.4 of this Regulation)



The above approval mark affixed to a vehicle shows that the vehicle type concerned has, with regard to steering equipment, been approved in the Netherlands (E 4) pursuant to Regulation No. 79 under approval No. 002439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 79 in its original form.

Model B

(See paragraph 4.5 of this Regulation)



The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in the Netherlands (E 4) pursuant to Regulation Nos. 79 and 31. 1/ The approval numbers indicate that, at the dates when the respective approvals were given, Regulation No. 79 was in its original form and Regulation No. 31 included the 01 series of amendments.

1/ The second number is given merely as an example.

Annex 3

BRAKING PERFORMANCE FOR VEHICLES USING THE SAME ENERGY SOURCE TO SUPPLY STEERING EQUIPMENT AND BRAKING DEVICE

1. If an energy source failure occurs, service braking performance on the first brake application shall achieve the values given in the table below.

Category	V (km/h)	m/s^2	FdaN
M1	80	5.8	50
M2 M3	60	5.0	70
N1	80	5.0	70
N2 N3	60	5.0	70

2. After any failure in the steering equipment, or the energy supply, it shall be possible after eight full stroke actuations of the service brake control, to achieve at the ninth application, at least the performance prescribed for the secondary (emergency) braking system (see table below).

In the case where secondary performance requiring the use of stored energy is achieved by a separate control, it shall still be possible after eight full stroke actuations of the service brake control to achieve at the ninth application, the residual performance (see table below).

	Category	V (km/h)	Secondary braking (m/s^2)	Residual braking (m/s^2)
SECONDARY AND RESIDUAL EFFICIENCY	M1	80	2.9	1.7
	M2	60	2.5	1.5
	M3	60	2.5	1.5
	N1	70	2.2	1.3
	N2	50	2.2	1.3
	N3	40	2.2	1.3

Annex 4

ADDITIONAL PROVISIONS FOR VEHICLES EQUIPPED WITH ASE

1. General Provisions

This annex does not require vehicles to be fitted with ASE. However, if the vehicles are fitted with such a device, they shall comply with the provisions of this annex.

2. Specific Provisions

2.1 Transmission

2.1.1. Mechanical steering transmissions

Paragraph 5.1.4. of this Regulation applies.

2.1.2. Hydraulic steering transmissions

The hydraulic steering transmission must be protected from exceeding the maximum permitted service pressure T.

2.1.3. Electric steering transmissions

The electric steering transmission must be protected from excess energy supply.

2.1.4. Combination of steering transmissions

A combination of mechanical, hydraulic and electric transmissions shall comply with the requirements specified in paragraphs 2.1.1., 2.1.2. and 2.1.3. above.

2.2. Testing requirements for failure

2.2.1. Malfunction or failure of any part of the ASE (except for parts not considered to be susceptible to breakdown as specified in paragraph 5.1.4. of this Regulation) shall not result in a sudden significant change in vehicle behaviour and the requirements of paragraphs 6.2.1. to 6.2.4. and 6.2.6. of this Regulation shall still be met. Furthermore, it must be possible to control the vehicle without abnormal steering correction. This shall be verified by the following tests:

2.2.1.1. Circular test

The vehicle shall be driven into a circle with a transverse acceleration of 5 m/s 2 and at a test speed of 80 km/h. The failure shall be introduced when the test speed has been reached. The test shall include driving in a clockwise direction, and in a counter-clockwise direction.

2.2.1.2. Transient test

2.2.1.2. Until uniform test procedures have been agreed, the vehicle manufacturer shall provide the technical services with their test procedures and results for transient behaviour of the vehicle in the case of failure.

2.3. Warning signals in case of failure

2.3.1. Except for parts of ASE not considered susceptible to breakdown as specified in paragraph 5.1.4. of this Regulation, the following failure of ASE shall be clearly brought to the attention of the driver.

2.3.1.1. A general cut-off of the ASE electrical or hydraulic control.

2.3.1.2. Failure of the ASE energy supply.

2.3.1.3. A break in the external wiring of the electrical control if fitted.

2.4. Electromagnetic interference

2.4.1. The operation of the ASE must not be adversely affected by electromagnetic fields. Until uniform test procedures have been agreed, the vehicle manufacturer shall provide the technical services with their test procedures and results.